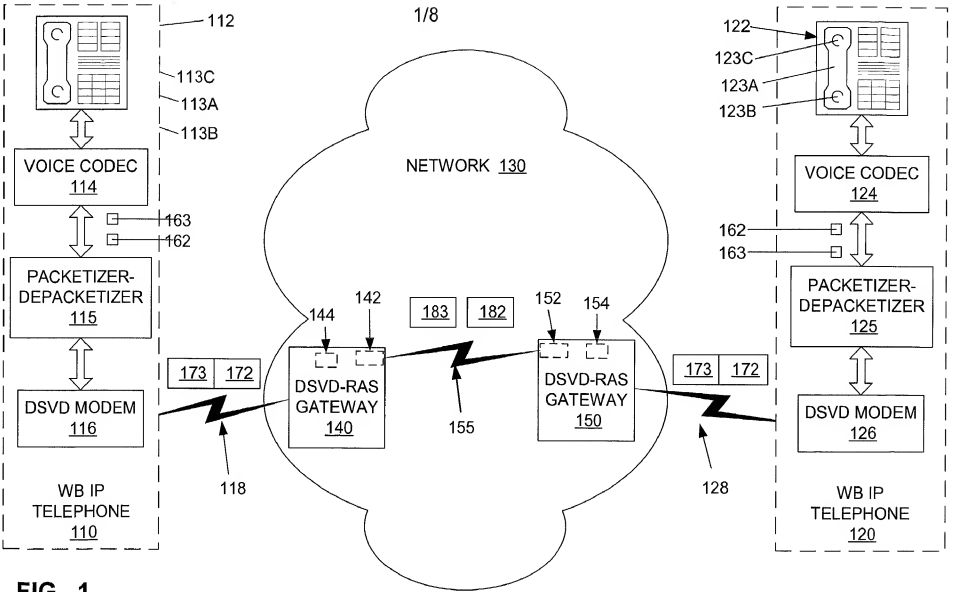
112
113C
113A
113B
VOICE CODEC
114
163
162
PACKETIZER-
DEPACKETIZER
115
DSVD MODEM
116
WB IP
TELEPHONE
110
118
173
172
144
142
DSVD-RAS
GATEWAY
140
NETWORK 130
183
182
155
152
154
DSVD-RAS
GATEWAY
150
173
172
128
122
123C
123A
123B
VOICE CODEC
124
162
163
PACKETIZER-
DEPACKETIZER
125
DSVD MODEM
126
WB IP
TELEPHONE
120

FIG. 1

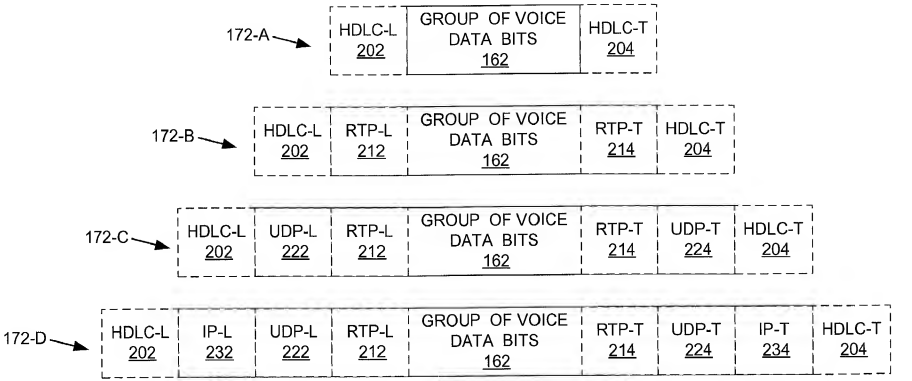
172-A
HDLC-L 202
GROUP OF VOICE DATA BITS 162
HDLC-T 204
172-B
HDLC-L 202
RTP-L 212
GROUP OF VOICE DATA BITS 162
RTP-T 214
HDLC-T 204
172-C
HDLC-L 202
UDP-L 222
RTP-L 212
GROUP OF VOICE DATA BITS 162
RTP-T 214
UDP-T 224
HDLC-T 204
172-D
HDLC-L 202
IP-L 232
UDP-L 222
RTP-L 212
GROUP OF VOICE DATA BITS 162
RTP-T 214
UDP-T 224
IP-T 234
HDLC-T 204

FIG. 2A

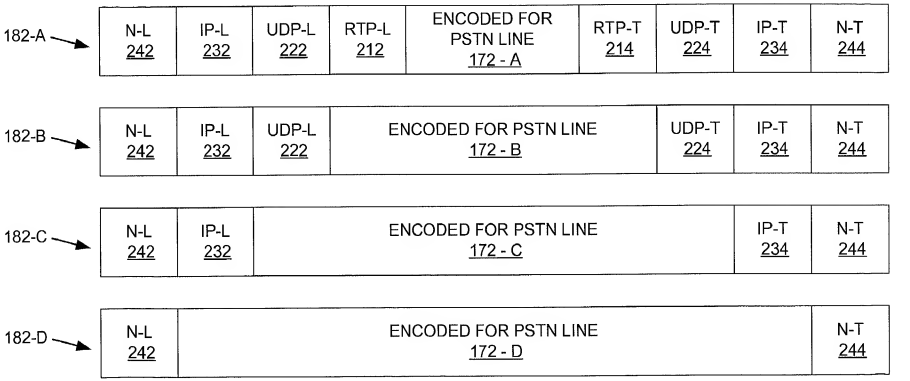
182-A
N-L 242
IP-L 232
UDP-L 222
RTP-L 212
ENCODED FOR PSTN LINE 172 - A
RTP-T 214
UDP-T 224
IP-T 234
N-T 244
182-B
N-L 242
IP-L 232
UDP-L 222
ENCODED FOR PSTN LINE 172 - B
UDP-T 224
IP-T 234
N-T 244
182-C
N-L 242
IP-L 232
ENCODED FOR PSTN LINE 172 - C
IP-T 234
N-T 244
182-D
N-L 242
ENCODED FOR PSTN LINE 172 - D
N-T 244

FIG. 2B

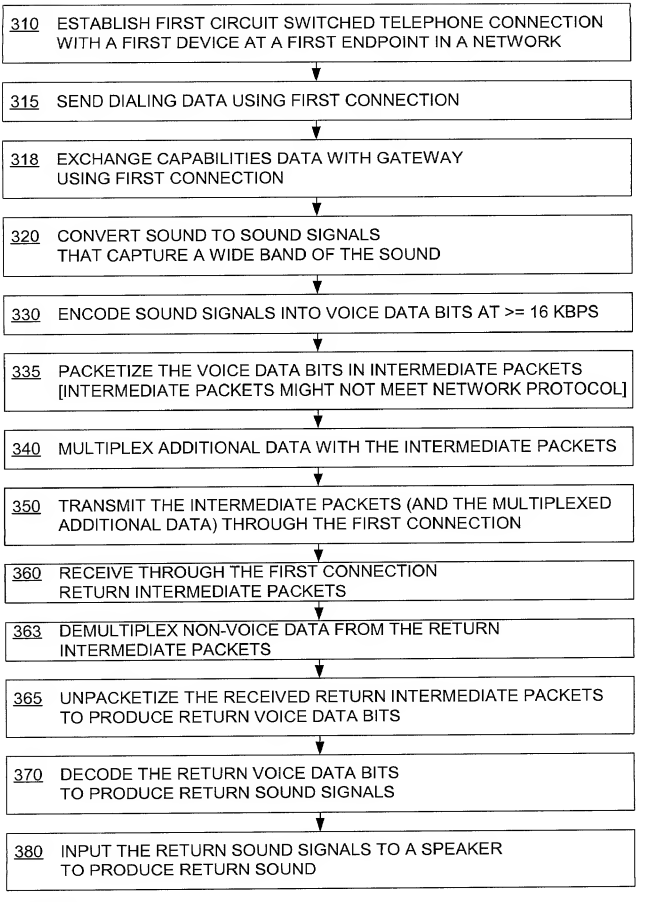
300
310 ESTABLISH FIRST CIRCUIT SWITCHED TELEPHONE CONNECTION WITH A FIRST DEVICE AT A FIRST ENDPOINT IN A NETWORK
315 SEND DIALING DATA USING FIRST CONNECTION
318 EXCHANGE CAPABILITIES DATA WITH GATEWAY USING FIRST CONNECTION
320 CONVERT SOUND TO SOUND SIGNALS THAT CAPTURE A WIDE BAND OF THE SOUND
330 ENCODE SOUND SIGNALS INTO VOICE DATA BITS AT >= 16 KBPS
335 PACKETIZE THE VOICE DATA BITS IN INTERMEDIATE PACKETS [INTERMEDIATE PACKETS MIGHT NOT MEET NETWORK PROTOCOL]
340 MULTIPLEX ADDITIONAL DATA WITH THE INTERMEDIATE PACKETS
350 TRANSMIT THE INTERMEDIATE PACKETS (AND THE MULTIPLEXED ADDITIONAL DATA) THROUGH THE FIRST CONNECTION
360 RECEIVE THROUGH THE FIRST CONNECTION RETURN INTERMEDIATE PACKETS
363 DEMULTIPLEX NON-VOICE DATA FROM THE RETURN INTERMEDIATE PACKETS
365 UNPACKETIZE THE RECEIVED RETURN INTERMEDIATE PACKETS TO PRODUCE RETURN VOICE DATA BITS
370 DECODE THE RETURN VOICE DATA BITS TO PRODUCE RETURN SOUND SIGNALS
380 INPUT THE RETURN SOUND SIGNALS TO A SPEAKER TO PRODUCE RETURN SOUND

FIG. 3

400

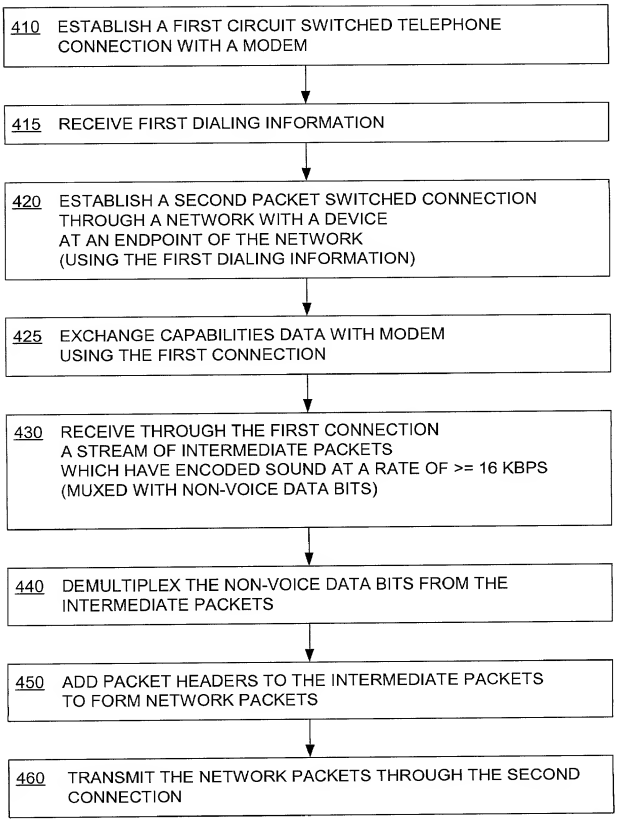
410 ESTABLISH A FIRST CIRCUIT SWITCHED TELEPHONE CONNECTION WITH A MODEM
415 RECEIVE FIRST DIALING INFORMATION
420 ESTABLISH A SECOND PACKET SWITCHED CONNECTION THROUGH A NETWORK WITH A DEVICE AT AN ENDPOINT OF THE NETWORK (USING THE FIRST DIALING INFORMATION)
425 EXCHANGE CAPABILITIES DATA WITH MODEM USING THE FIRST CONNECTION
430 RECEIVE THROUGH THE FIRST CONNECTION A STREAM OF INTERMEDIATE PACKETS WHICH HAVE ENCODED SOUND AT A RATE OF >= 16 KBPS (MUXED WITH NON-VOICE DATA BITS)
440 DEMULTIPLEX THE NON-VOICE DATA BITS FROM THE INTERMEDIATE PACKETS
450 ADD PACKET HEADERS TO THE INTERMEDIATE PACKETS TO FORM NETWORK PACKETS
460 TRANSMIT THE NETWORK PACKETS THROUGH THE SECOND CONNECTION

FIG. 4

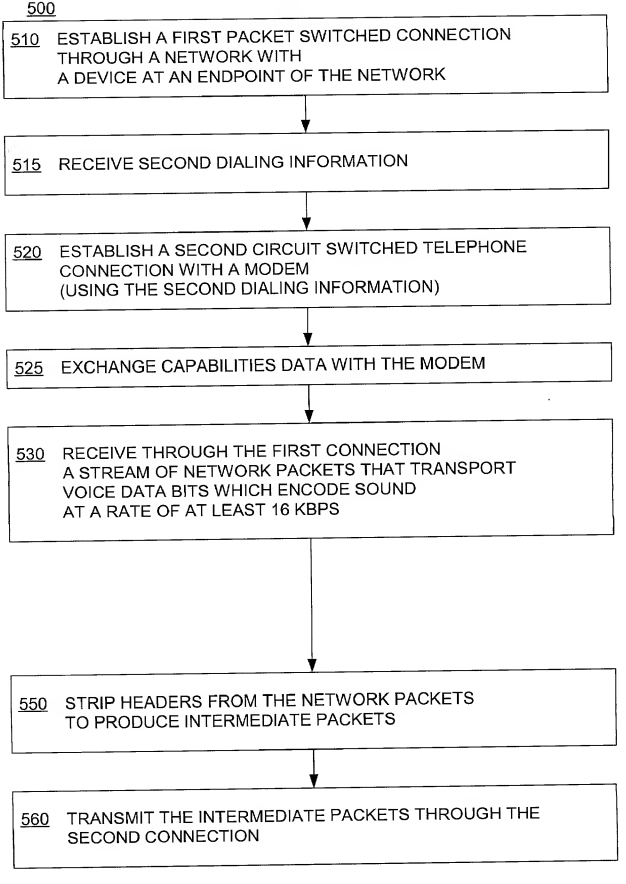
500
510 ESTABLISH A FIRST PACKET SWITCHED CONNECTION THROUGH A NETWORK WITH A DEVICE AT AN ENDPOINT OF THE NETWORK
515 RECEIVE SECOND DIALING INFORMATION
520 ESTABLISH A SECOND CIRCUIT SWITCHED TELEPHONE CONNECTION WITH A MODEM (USING THE SECOND DIALING INFORMATION)
525 EXCHANGE CAPABILITIES DATA WITH THE MODEM
530 RECEIVE THROUGH THE FIRST CONNECTION A STREAM OF NETWORK PACKETS THAT TRANSPORT VOICE DATA BITS WHICH ENCODE SOUND AT A RATE OF AT LEAST 16 KBPS
550 STRIP HEADERS FROM THE NETWORK PACKETS TO PRODUCE INTERMEDIATE PACKETS
560 TRANSMIT THE INTERMEDIATE PACKETS THROUGH THE SECOND CONNECTION

FIG. 5

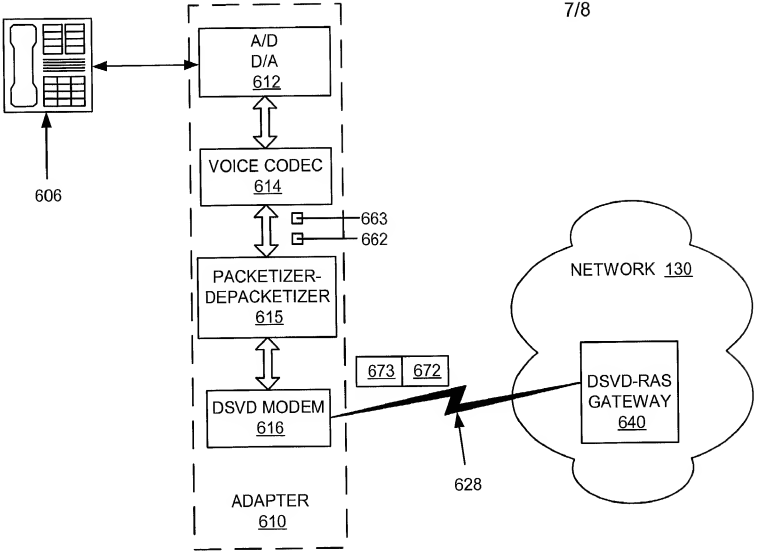
A/D
D/A
612
VOICE CODEC
614
606
663
662
PACKETIZER-
DEPACKETIZER
615
673
672
DSVD MODEM
616
ADAPTER
610
628
NETWORK 130
DSVD-RAS
GATEWAY
640

FIG. 6

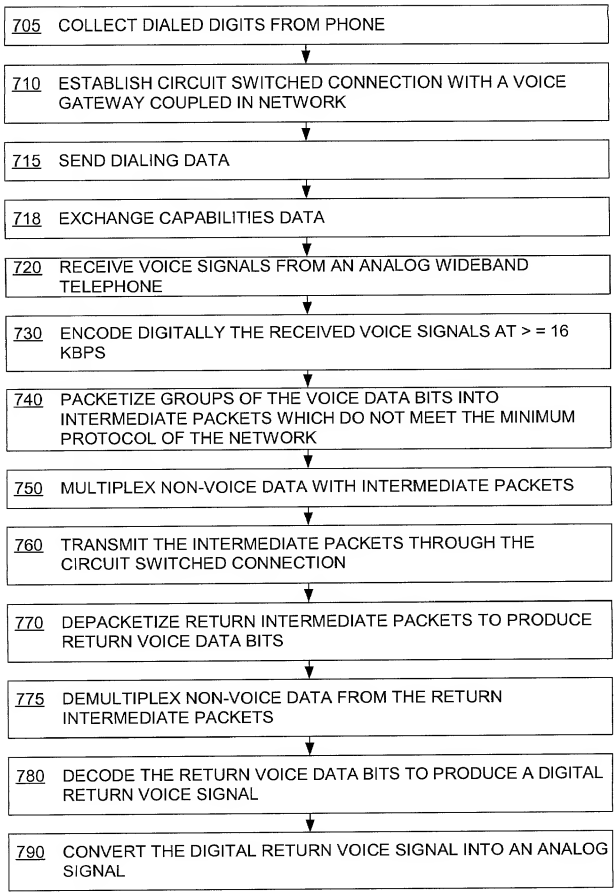
700
705 COLLECT DIALED DIGITS FROM PHONE
710 ESTABLISH CIRCUIT SWITCHED CONNECTION WITH A VOICE GATEWAY COUPLED IN NETWORK
715 SEND DIALING DATA
718 EXCHANGE CAPABILITIES DATA
720 RECEIVE VOICE SIGNALS FROM AN ANALOG WIDEBAND TELEPHONE
730 ENCODE DIGITALLY THE RECEIVED VOICE SIGNALS AT > = 16 KBPS
740 PACKETIZE GROUPS OF THE VOICE DATA BITS INTO INTERMEDIATE PACKETS WHICH DO NOT MEET THE MINIMUM PROTOCOL OF THE NETWORK
750 MULTIPLEX NON-VOICE DATA WITH INTERMEDIATE PACKETS
760 TRANSMIT THE INTERMEDIATE PACKETS THROUGH THE CIRCUIT SWITCHED CONNECTION
770 DEPACKETIZE RETURN INTERMEDIATE PACKETS TO PRODUCE RETURN VOICE DATA BITS
775 DEMULTIPLEX NON-VOICE DATA FROM THE RETURN INTERMEDIATE PACKETS
780 DECODE THE RETURN VOICE DATA BITS TO PRODUCE A DIGITAL RETURN VOICE SIGNAL
790 CONVERT THE DIGITAL RETURN VOICE SIGNAL INTO AN ANALOG SIGNAL

FIG. 7